

BRIEF REPORT

Posttraumatic Stress Disorder as a Risk Factor for Suicidal Ideation in Iraq and Afghanistan War Veterans

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Posttraumatic stress disorder (PTSD) was examined as a risk factor for suicidal ideation in Iraq and Afghanistan War veterans (N = 407) referred to Veterans Affairs mental health care. The authors also examined if risk for suicidal ideation was increased by the presence of comorbid mental disorders in veterans with PTSD. Veterans who screened positive for PTSD were more than 4 times as likely to endorse suicidal ideation relative to non-PTSD veterans. Among veterans who screened positive for PTSD (n = 202), the risk for suicidal ideation was 5.7 times greater in veterans who screened positive for two or more comorbid disorders relative to veterans with PTSD only. Findings are relevant to identifying risk for suicide behaviors in Iraq and Afghanistan War veterans.

Since the beginning of hostilities in 2001, there has been an increase in rates of suicide among active duty soldiers deployed to Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF; Mental Health Advisory Team, 2008). In addition, a recent study found that OIF/OEF veterans diagnosed with mental disorders commit suicide at a higher rate than persons in the general population (standardized mortality ratio = 1.77, CI = 1.01–2.87; Kang & Bullman, 2008). These findings are consistent with prior research with Vietnam veterans showing that psychiatric symptoms increase risk of suicide attempts (Fontana & Rosenheck, 1995) and that posttraumatic stress disorder (PTSD) predicts completed suicides (Bullman & Kang, 1994). In Vietnam vet-

erans, PTSD comorbid with depression (Kramer, Lindy, Green, Grace, & Leonard, 1994) is associated with increased suicidality and the risk for completed suicide is nearly double among veterans with PTSD and comorbid mental disorders relative to those with PTSD only (Bullman & Kang, 1994).

This study assesses the relationship between PTSD and suicidal ideation in a clinical sample of OIF/OEF veterans. Posttraumatic stress disorder is the primary focus of the current study because it is the most frequently diagnosed mental disorder among OIF/OEF veterans seeking Veterans Affairs (VA) health care (Seal, Bertenthal, Miner, Sen, & Marmar, 2007) and because of prior research linking PTSD with suicidality in Vietnam veterans. Suicidal ideation is

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selected as the study endpoint because it is among the strongest predictors of a suicide attempt (Mann et al., 2008). Determining the strength of the relationship between PTSD, comorbid mental disorders, and suicidal ideation has implications for identifying risk factors for suicide behaviors in OIF/OEF veterans.

The current study utilized self-report measures administered to OIF/OEF veterans referred to mental health services at the VA Puget Sound Health Care System (VAPSHCS) in Seattle, Washington. We hypothesized that, after accounting for other risk factors, veterans who screened positive for PTSD would be more likely to report suicidal ideation compared to veterans who did not screen positive for PTSD. Further, we predicted that veterans with PTSD who screened positive for mental disorders comorbid with PTSD would be more likely to endorse suicidal ideation than did veterans with PTSD only, and that those endorsing multiple comorbidities would be at greatest risk.

METHOD

Participants

The entire sample was comprised of 435 OIF/OEF veterans who were consecutively assessed and referred for mental health services at VA Puget Sound Health Care System from 2004 to 2007. The study protocol was approved by the University of Washington Internal Review Board and the Research and Development Committee of VAPSHCS.

Missing values of relevant covariates (age, $n = 10$) were replaced with the group means; cases missing key variables were omitted ($n = 28$), resulting in a final sample of 407 participants. The majority of the participants were men (90.4%) and the average age was 32 years ($SD = 9$). The majority self-identified as non-Hispanic White (65.1%), 10.6% African American, 7.7% Hispanic, 5.2% Native American or Pacific Islander, 4.4% Asian, and 5.7% Other. Sixty percent (60.1%) indicated they were applying for service-connected disability and 10.9% indicated they were currently service connected for PTSD. The majority were not married (55.2%) and 44.8% were married or remarried. Average years of education was 13.5 ($SD = 2.0$). Half (49.6%) of the OIF/OEF veterans screened positive for PTSD; 34.9% screened positive for major depressive disorder (MDD), 31.7% screened positive for alcohol abuse, and 5.2% screened positive for drug abuse; 36.7% were referred for mental health services, but did not screen positive for PTSD, MDD, alcohol or drug abuse. Twelve veterans (3%) reported a suicide attempt within the previous 4 months.

Measures

Participants completed paper and pencil versions of self-report measures upon intake. The military version of the PTSD Checklist (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993)

was used to assess PTSD symptoms. Screening criteria for PTSD required a PCL-M global score of 50 and the presence of symptoms endorsed at a moderate or high level across the three symptom clusters per the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (American Psychiatric Association, 1994) algorithm for diagnosing PTSD. The Patient Health Questionnaire Depression subscale (Spitzer, Kroenke, & Williams, 1999) was used to assess the presence of five or more depressive symptoms endorsed at moderately severe or more severe suggestive of depressive episode per the *DSM-IV* algorithm for diagnosing MDD. The Addiction Severity Index (McLellan et al., 1985) was used to assess alcohol and drug abuse; veterans were coded as positive for alcohol or drug abuse if they endorsed items describing impairments in functioning attributable to substance abuse in a manner consistent with *DSM-IV* criteria.

Suicidal ideation was assessed using a composite of five items drawn from the short form of the Mississippi Scale for PTSD (Fontana & Rosenheck, 1994) and the Scale for Suicidal Ideation (Beck, Kovacs, & Weissman, 1979). Two items ask respondents to rate the degree to which they (a) feel like killing themselves or (b) feel they cannot go on (1 = *not at all true*, 2 = *slightly true*, 3 = *somewhat true*, 4 = *very true*, 5 = *extremely true*). Three items ask respondents to rate (1) their desire to make a suicide attempt (1 = *no desire*, 2 = *weak desire*, 3 = *moderate to strong desire*), (2) the frequency of suicidal ideation (1 = *never*, 2 = *rarely/occasionally*, 3 = *off and on*, 4 = *persistently or continuously*), and (3) control over suicidal ideation (1 = *no thoughts of suicide*, 2 = *sure of control over attempting*, 3 = *unsure of control over attempting*, 4 = *no sense of control over attempting*).

This five-item constructed measure of suicidal ideation demonstrated excellent internal consistency ($\alpha = .90$), although the suicidal ideation variable was dichotomized (suicidal ideation vs. no suicidal ideation) because more than half of the study participants (54.1%) did not endorse any suicidal ideation, resulting in a positively skewed distribution. Participants were coded as having suicidal ideation if they endorsed at least one of the five suicidal ideation items as positive (indicating suicidal ideation was present). The clinical significance of the measure of suicidal ideation was assessed by determining the degree to which it correctly classified veterans who reported a recent suicide attempt. Of the 12 participants who endorsed having made a suicide attempt during the prior 4 months, 11 (91.6%) were correctly identified in the suicidal ideation group, $\chi^2(1, N = 407) = 10.47, p < .01$.

RESULTS

Veterans in the suicidal ideation ($n = 187$) and no suicidal ideation groups ($n = 220$) were compared on sociodemographic variables (gender, age, race/ethnicity, years of education, marital status) using one-way analyses of variance for continuously scaled variables and chi-squared tests for dichotomous variables. Only significant differences in age emerged; subjects in the suicidal ideation group

Table 1. Predictors of Suicidal Ideation, Determined by Binary Logistic Regression Analyses ($N = 407$)

Mental disorders	Wald	OR (Adjusted)	95% CI
Posttraumatic stress disorder	28.82	4.45	2.58–7.67**
Major depressive disorder	19.80	3.63	2.01–6.40**
Alcohol abuse	6.23	2.00	1.15–3.31**
Drug abuse	5.01	4.03	1.20–13.58**
Age	5.01	1.03	1.00–1.06**

* $p < .05$. ** $p < .01$.

Table 2. PTSD Comorbidity Severity Index as a Predictor of Suicidal Ideation ($N = 202$)

PTSD comorbidity	Wald	OR (Adjusted)	95% CI
PTSD + 1 comorbid mental disorder	0.89	1.52	0.64–3.62
PTSD + 2 or more comorbid mental disorders	9.90	5.71	2.09–23.85*
Age (covariate)	10.09	1.07	1.03–1.12*

Note. Each level of the PTSD comorbidity index is compared to the risk of suicidal ideation associated with PTSD alone after controlling for age. PTSD = Posttraumatic stress disorder.

* $p < .01$.

were older, $F(1,405) = 8.43$, $p < .01$, than those in the no suicidal ideation group. Group differences in age were statistically controlled by placing this variable in the regression models as a covariate.

We tested two separate statistical models. In the first, we used binomial logistic regression to test the hypothesis that PTSD would be associated with an increased likelihood of suicidal ideation among veterans after controlling for age and other mental health diagnoses. The first hypothesis was confirmed. Controlling for age, MDD, alcohol abuse, and drug abuse, veterans with PTSD were over four times more likely to endorse suicidal ideation than those without PTSD (See Table 1).

In the second analysis, we restricted the logistic regression analysis to veterans who screened positive for PTSD ($n = 202$) and examined whether veterans with additional psychiatric comorbidities (MDD, alcohol abuse, and drug abuse) would be more likely to endorse suicidal ideation than those with PTSD only. To do so, we created a PTSD Comorbidity Index that consisted of two dummy-coded variables of PTSD comorbidity. For each variable the reference group was patients who met criteria for PTSD only ($n = 35$). In the first dummy variable, we contrasted PTSD only with PTSD + 1 comorbidity ($n = 112$); in the second we contrasted PTSD only with PTSD + 2 or more comorbidities ($n = 55$). Unexpectedly, veterans with PTSD + 1 comorbidity were not significantly more likely to endorse suicidal ideation relative to veterans with PTSD only. However, veterans with PTSD + 2 comorbidities were 5.7 times more likely to

endorse suicidal ideation than veterans with PTSD only (see Table 2).

DISCUSSION

Prior research with Vietnam veterans with chronic PTSD has established an association between PTSD and suicide (Bullman & Kang, 1994). This study extends these findings by demonstrating an association between suicidal ideation and PTSD in treatment-seeking OIF/OEF veterans with more acute forms of PTSD. PTSD was significantly associated with suicidal ideation after accounting for age, depression and substance abuse, with PTSD veterans over four times more likely to report suicidal ideation than veterans who did not screen positive for PTSD. Among veterans who screened positive for PTSD, there was no significant increase in risk for suicidal ideation associated with a single comorbid disorder. However, the likelihood for suicidal ideation was 5.7 times greater in veterans with PTSD who screened positive for two or more comorbid disorders relative to veterans with PTSD alone. Results suggest that veterans with PTSD who have multiple psychiatric comorbidities may be at greatest risk for suicidal ideation. This increased likelihood of suicidal ideation associated with comorbidity is notable because, of those OIF/OEF veterans diagnosed with a mental disorder, 27% have three or more different mental health diagnoses (Seal et al., 2007).

The current findings should be considered within the context of study limitations. Data were gathered from standard self-report

questionnaires rather than clinical interviews to establish diagnoses and suicidal ideation. Although the five-item suicidal ideation variable demonstrated good reliability and validity, future studies should utilize structured clinical interviews to assess suicidal ideation and self-harm behaviors in OIF/OEF veterans. Second, because of the low base rate of suicide attempts in this sample and limited statistical power, we were unable to examine predictors of suicidal behavior. Large-scale prospective studies should examine suicidal ideation as a predictor of subsequent suicide attempts in OIF/OEF veterans as well as the additive and interactive effects of PTSD, depression, or substance abuse as predictors of suicidal behaviors. Third, individual symptoms of each mental disorder either directly or indirectly relate to suicidality (i.e., thoughts of death associated with depression, foreshortened future associated with PTSD, recklessness associated with alcohol and drug abuse). Thus, the association between mental disorders and suicidal ideation may not be considered surprising.

The current study provides information relevant to the clinical care of OIF/OEF veterans. Similar to findings from other studies, our results indicate that PTSD is the most common mental disorder among OIF/OEF veterans seeking VA services. High prevalence of PTSD in OIF/OEF veterans underscores the importance of our finding that PTSD is a strong risk factor for suicidal ideation in OIF/OEF veterans referred to mental health services. In addition, the current findings suggest that veterans with PTSD and multiple comorbid mental disorders are more likely to endorse suicidal ideation. The strong link between suicidal ideation and actual suicide attempts established in prior research (Mann et al., 2008) suggests that PTSD in OIF/OEF veterans may place them at risk for overt suicidal behaviors.

The VA Health Care Administration has taken several steps to prevent suicide in veterans, including routine screening of PTSD, MDD, and substance abuse in veterans and suicide screenings for those who screen positive for PTSD or depression. A 24-hour suicide and crisis hotline has been established for veterans and the VA has initiated outreach and informational campaigns to engage OIF/OEF veterans who might not otherwise seek care. Current findings underscore the importance of assessing for suicidal ideation in OIF/OEF veterans, especially among PTSD veterans with complex psychiatric profiles.

REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Beck, A. T., Kovacs, M., & Weissman, A. (1979). Assessment of suicidal intention: The Scale for Suicide Ideation. *Journal of Consulting and Clinical Psychology*, 47, 343–352.
- Bullman, T. A., & Kang, H. K. (1994). Posttraumatic stress disorder and the risk of traumatic deaths among Vietnam veterans. *Journal of Nervous and Mental Disease*, 182, 604–610.
- Fontana, A., & Rosenheck, R. (1994). A short form of the Mississippi Scale for measuring change in combat-related PTSD. *Journal of Traumatic Stress*, 7, 407–414.
- Fontana, A., & Rosenheck, R. (1995). An etiological model of attempted suicide among Vietnam theater veterans. Prospective generalization to a treatment-seeking sample. *Journal of Nervous and Mental Disease*, 183, 377–383.
- Kang, H. K., & Bullman, T. A. (2008). Risk of suicide among US veterans after returning from the Iraq and Afghanistan War Zones. *Journal of the American Medical Association*, 300, 652–653.
- Kramer, T. L., Lindy, J. D., Green, B. L., Grace, M. C., & Leonard, A. C. (1994). The comorbidity of post-traumatic stress disorder and suicidality in Vietnam veterans. *Suicide Life Threatening Behavior*, 24, 58–67.
- Mann, J. J., Ellis, S. P., Waternaux, C. M., Liu, X., Oquendo, M. A., Malone, K. M., et al. (2008). Classification trees distinguishing suicide attempters in major psychiatric disorders: A model of clinical decision making. *Journal of Clinical Psychiatry*, 69, 23–31.
- McLellan, A. T., Luborsky, L., Cacciola, J., Griffith, J., Evans, F., Bar, H. L., et al. (1985). New data from the Addiction Severity Index: Reliability and validity in three centers. *Journal of Nervous and Mental Disease*, 173, 412–423.
- Mental Health Advisory Team (MHAT) V. (2008). Operation Iraqi Freedom 06–08: Iraq. Operation Enduring Freedom 08: Afghanistan. Final Report. Retrieved June 1, 2009, from <http://www.armymedicine.army.mil/reports/mhat/mhat-v/mhat-v.cfm>
- Seal, K. H., Bertenthal, D., Miner, C. R., Sen, R., & Marmar, C. (2007). Bringing the war back home: Mental health disorders among 103,788 US veterans returning from Iraq and Afghanistan seen at Department of Veterans Affairs facilities. *Archives of Internal Medicine*, 12, 476–482.
- Spitzer, R. L., Kroenke, K., & Williams, J. B. (1999). Patient Health Questionnaire Study Group. Validity and utility of a self-report version of PRIME-MD: The PHQ Primary Care Study. *Journal of the American Medical Association*, 282, 1737–1744.
- Weathers, F. W., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993, October). The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility. Poster presented at the Annual Conference of International Society for Traumatic Stress Studies. San Antonio, TX.